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VINIFERA GRAPES IN NEW YORK.

R. D. ANTHONY

UNDER DIRECTION OF

U. P. HEDRICK.



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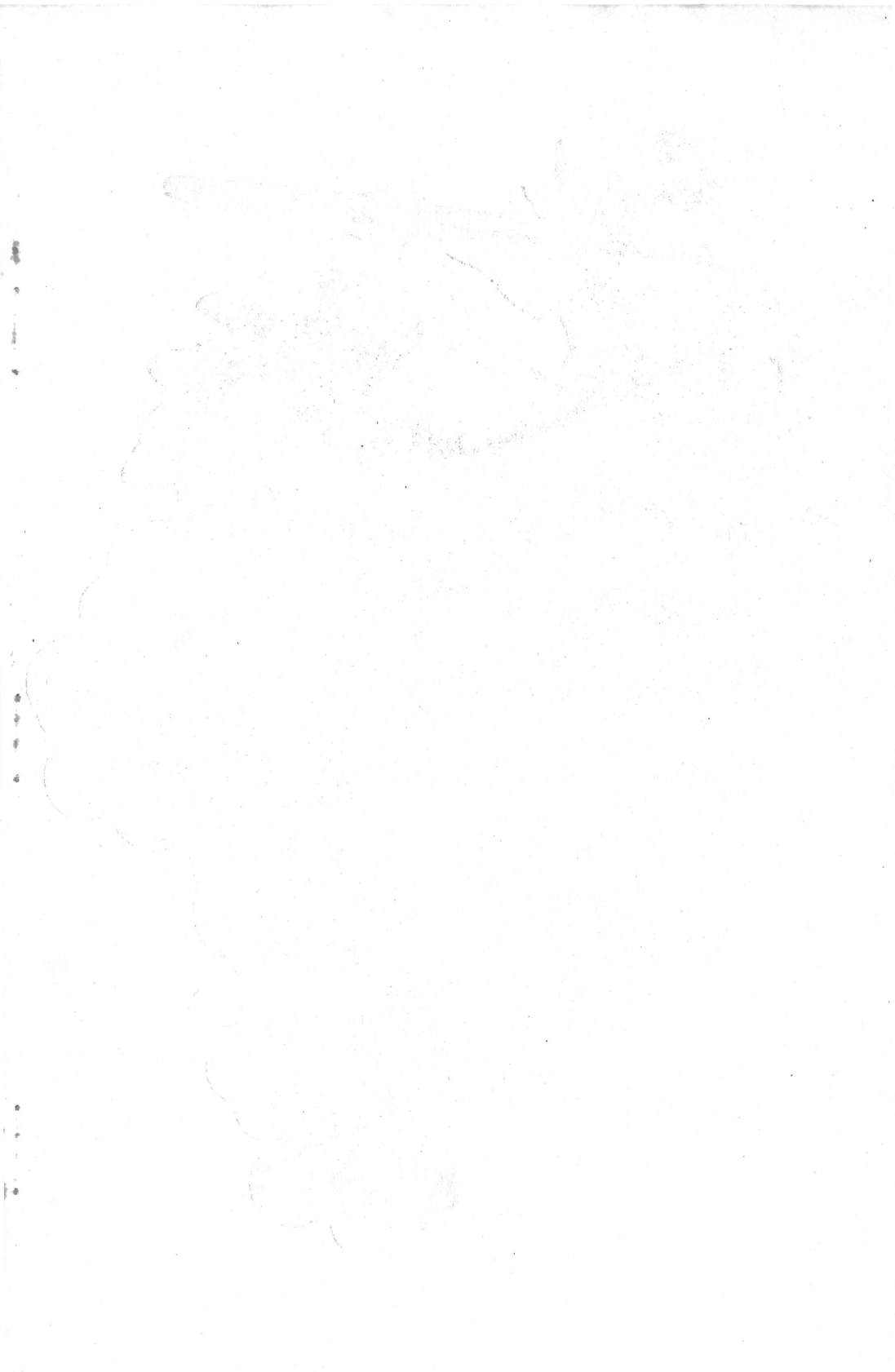
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 NEW YORK AGRICULTURAL EXPERIMENT STATION, GENEVA, N. Y.

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*Connected with Grape Culture Investigations.





MUSCAT HAMBURG
(ONE-HALF NATURAL SIZE)

BULLETIN No. 432.

VINIFERA GRAPES IN NEW YORK.

R. D. ANTHONY

UNDER DIRECTION OF

U. P. HEDRICK.

SUMMARY.

For two hundred years the colonists and early horticulturists tried in vain to grow the European grape, *Vitis vinifera*, in eastern America. Every attempt resulted in failure until finally the conviction became thoroly established that this grape could not be grown in this region. The end of these attempts was hastened by the discovery of satisfactory native sorts such as Isabella and Catawba.

In the meantime very different results were being secured on the Pacific coast where, in southern and central California, the Vinifera grapes found congenial conditions.

In the century which has passed since the last serious attempt to grow these grapes in the east, we have learned that there were four chief causes for these failures: (1) the downy and powdery mildews, (2) black-rot, (3) a root-sucking louse called the phylloxera and (4) winter injury. Satisfactory means of control have been found for all these troubles.

Experimental culture of the European grape was undertaken at this Station in 1902 when cuttings or plants of 19 varieties were received. In 1911 cuttings of more than 70 varieties were received and grafted upon a miscellaneous collection of Station seedlings ranging from 6 to 10 years old. The results were very satisfactory, most of the plants fruiting in 1913.

By giving the vines winter protection and the usual grape sprays they have been kept in a healthy condition.

As a result of the work at Geneva certain cultural recommendations can be made for New York. One of the most serious difficulties

is to secure plants of the desired kinds. Few can be had from eastern nurseries and not a great number from those in California and then not always on resistant roots. For this reason it will frequently be desirable for the eastern grower to know how to graft cuttings on phylloxera-resistant roots such as *Vitis riparia*. This can be done in the nursery row or in the vineyard.

In planting Viniferas less space need be given the vines than with native sorts. Rows six feet apart and plants six feet in the row is a satisfactory distance. Care should be taken that grafted vines do not form roots from the cion.

In the east it is probably best to support the vines with the regular two-wire trellis.

Because of the necessity of bending the trunk to the ground for winter protection, a replacing spur should be left at the base of the trunk to use in forming a new trunk when the old one becomes too stiff. The main trunk should be carried to the lower wire and two fruit canes and two renewal spurs provided for. The young shoots which spring from these canes and spurs grow upright to the second wire when they are pinched off and tied. This gives stockier and more mature canes for the following season.

Cheap winter protection is secured by bending the vines to the ground and covering with a few inches of dirt.

The chief value of the Vinifera grape at present in this State is as a home-garden grape for the amateur, for the commercial grower supplying local markets demanding high quality, and for the plant-breeder seeking to improve the quality of our present varieties.

Most of the Vinifera varieties have originated in regions with a longer season and a much warmer climate than that of New York and many kinds included in the test at Geneva have been discarded because, even in the most favorable seasons, they have not reached maturity.

The varieties are discussed in four groups: (1) Desirable varieties for the grape regions of the State for (a) the table and (b) wine; (2) sorts worthy of testing in the more favorable parts of the State for (a) table and (b) wine; (3) kinds still on probation; (4) varieties of little or no value in the State.

EARLY ATTEMPTS TO GROW VINIFERAS IN THE EASTERN STATES.

The story of the early attempts to introduce the European grape, *Vitis vinifera*, is one of the most interesting chapters in the history of fruit-growing in America — a story which has already been told so well and so often that it is unnecessary here to do more than sketch the main events. In all the accounts left by the early explorers of our Atlantic coast is expressed their surprise at the abundance of grapes growing wild in the woods and thickets. The first colonists were not slow in pressing these into wine for, to them, the vine meant not the table delicacy that it is to us but the sparkling juice which, in those days, seemed so much a necessity of life.

In spite of the many optimistic reports which these early wine-pressers sent back to the Old World, it was soon evident that these wild grapes lacked that clear, vinous flavor so necessary to a good wine grape. For this reason when vineyards came to be planted, cuttings or seeds were sent from France and Germany. For nearly two hundred years the history of these plantations of European sorts is one long series of failures and discouragements. Even in the hands of the most expert vineyardists sent to this country at great expense, the vines soon sickened and died under the adverse conditions of the new country.

One of the last extensive attempts to grow the *Vinifera* grape in the eastern states was made in Kentucky and Indiana in the early days of the Nineteenth Century by a company of Swiss vineyardists. Many of the best European sorts were introduced but all failed save one, the Cape Grape or Alexander, and all the evidence would indicate that this was a native grape placed in the vineyard by accident.

At about the same time two events took place which changed the whole nature of grape-growing in America — the Isabella grape was discovered in South Carolina and the Catawba in Maryland. Both of these are native grapes and their success marked the end of the first chapter of the story of the *Vinifera* grape in the east. Since then for nearly seventy-five years, European sorts have been grown only in a limited way by amateurs and then chiefly under glass. During this time the belief that *Viniferas* could not be grown successfully out of doors in the east became widespread.

It is, perhaps, well to describe some of the differences between the fruit of *Vitis vinifera* and that of our native species. The European grapes have a higher content of sugar and solids, which gives them greater richness and adds to their keeping qualities. Their clear, vinous flavor, frequently with an attractive sprightliness, makes the "foxiness" so strong in many of our native *Labruscas* seem undesirable in comparison. The greater size of both bunch and berry in many of the foreign kinds adds to their attractiveness. The most noticeable difference is the adherence of the skin and flesh and their greater freedom from objectionable acid or astringency so that many kinds can be eaten whole. In general the *Viniferas* are more attractive, of richer flavor and better quality and keep much longer in storage.

THE EUROPEAN GRAPE IN CALIFORNIA.

While these grapes were failing so completely in the east very different results were being secured on the western coast. We seldom think of the early Spaniards as bringing anything to Mexico save destruction and desolation, yet some of their most lasting monuments are the missions which they established in the territory which is now the northern part of Mexico and the southwestern states of the Union. These pioneer *padres* were horticulturists of no mean merit and from the mission plantations the Indians learned to grow many European fruits. It was in this way that the *Vinifera* grape first reached California. Those conditions which caused the failures in the east were lacking here and the mission grapes flourished and spread to become finally the incentive and example which has made California a great grape-growing and wine-making state with 360,000 acres set to vines.

HISTORY OF THE WORK AT GENEVA.

A century has passed since the introduction of the Isabella grape — a hundred years during which science has taught the fruit-grower many things to aid him in his art. We know now that the causes of the early failures with the European grape in the east were chiefly four: (1) The downy and powdery mildews, (2) black rot, (3) a root-sucking louse called the phylloxera which destroys the *Vinifera* roots but seldom injures the roots of the native grapes, and (4) the

inability of this species to withstand the severity of our winters without protection. For all these troubles, satisfactory methods of control have been found, yet, in spite of this, so thoroly have we been taught to believe that *Vinifera* grapes could not be grown in this region that few have attempted their culture.

An experiment station is always justified in trying the things that "can't be done" when a solution of the problem would seem to be worth while. Such experiments succeed often enough to show that the "impossible" of tradition is purely a relative term.

In the spring of 1902 cuttings of 14 varieties of *Viniferas* were sent to this Station by W. A. Taylor of the United States Department of Agriculture. These were bench-grafted on cuttings of phylloxera-resistant sorts and planted in the nursery. Lack of proper winter protection caused the loss of all but one variety. The fall of the same year plants of 5 varieties of this species were received from Dr. G. L. Tinker, New Philadelphia, Ohio, who then had a number of European varieties fruiting satisfactorily in a test plantation. Tho we have no statement to that effect, the vines sent to Geneva were doubtless grafted, as Dr. Tinker regularly treated his *Viniferas* in this way. These six varieties were planted in one of the Station variety vineyards in 1903, in most cases two vines of each kind being set out. Tho two or three vines have died, the remaining ones, after more than thirteen years, are alive and most of them giving good crops.

In the spring of 1910, thru the kindness of George C. Husmann, in charge of the viticultural investigations of the United States Department of Agriculture, a number of grafted vines were sent to the Station. These arrived late in the spring and then were sent to the Vineyard Laboratory at Fredonia in Chautauqua County so that the buds started into growth before planting. This, with unfavorable soil and weather conditions, resulted in the death of most of the plants.

In the spring of 1911, Mr. Husmann sent the Station cuttings of 71 varieties and at the same time Frederic T. Bioletti, Viticulturist of the California Experiment Station, sent cuttings of 30 kinds. At that time a number of vines from six to ten years old in one of the seedling vineyards at the Station had been marked for discarding. Altho these were of miscellaneous origin and contained blood of several species and so were not ideal for such an experiment, it was

decided to use them as stocks. They were, therefore, cut off at the ground and cleft-grafted, from two to six seedlings being worked to a single variety. The results were very satisfactory, only two varieties being lost and 70 per ct. of the vines being alive after two years.

The first year the grafts made a vigorous growth. In the fall the shoots were bent to the ground and a few inches of dirt thrown over them. In the spring, as soon as the ground could be worked, they were uncovered and tied to the trellis. With this cheaply applied protection they went thru the winter without injury. Some of the vines fruited in 1912 and since then the *Viniferas* have, as a whole, borne crops as good or better than most of our native sorts, when allowance is made for the smaller size of the *Vinifera* vines.

In most seasons the vines have received two applications of bordeaux and lead arsenate spray. No black-rot has been seen in the vineyard and very little mildew. Owing to a severe attack of leaf-hoppers in 1915, it was necessary to give the *Viniferas* an extra application of a nicotine spray. Except for this, the vines have been given the same cultivation and spraying as the native seedlings growing alongside of them.

CULTURAL RECOMMENDATIONS FOR NEW YORK BASED ON THE RESULTS AT GENEVA.

Propagation.—For some time to come the greatest difficulty in growing *Viniferas* in the east will be in securing plants of the desired varieties. This Station is, at present, unable to send out either vines or cuttings as all available material is being used in various experiments. Very few eastern nurserymen sell varieties of this species and the kinds which are carried are mainly for growing under glass—too late for outdoor work. At present the best sources are the California nurseries, but even here only a limited list of varieties can be secured and frequently these are not grafted on the desired resistant roots. As soon as ocean freight traffic is restored to a normal condition it will be possible to import vines from foreign nurseries either direct or thru the agency of some New York nursery company.

It is always best to buy rooted vines but sometimes it is necessary to take cuttings in order to secure some much desired variety. This immediately brings up several problems in the handling of cuttings.

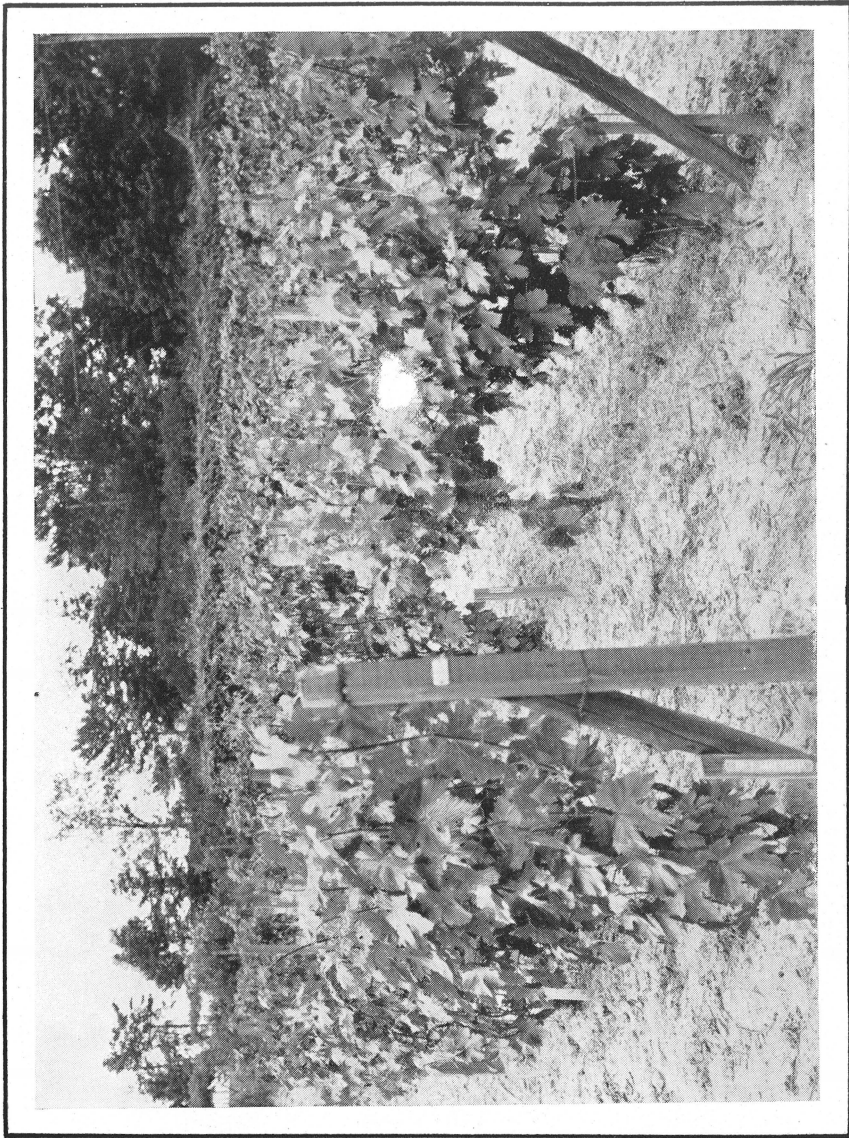


PLATE I.—VIEW IN VINIFERA TEST VINEYARD.

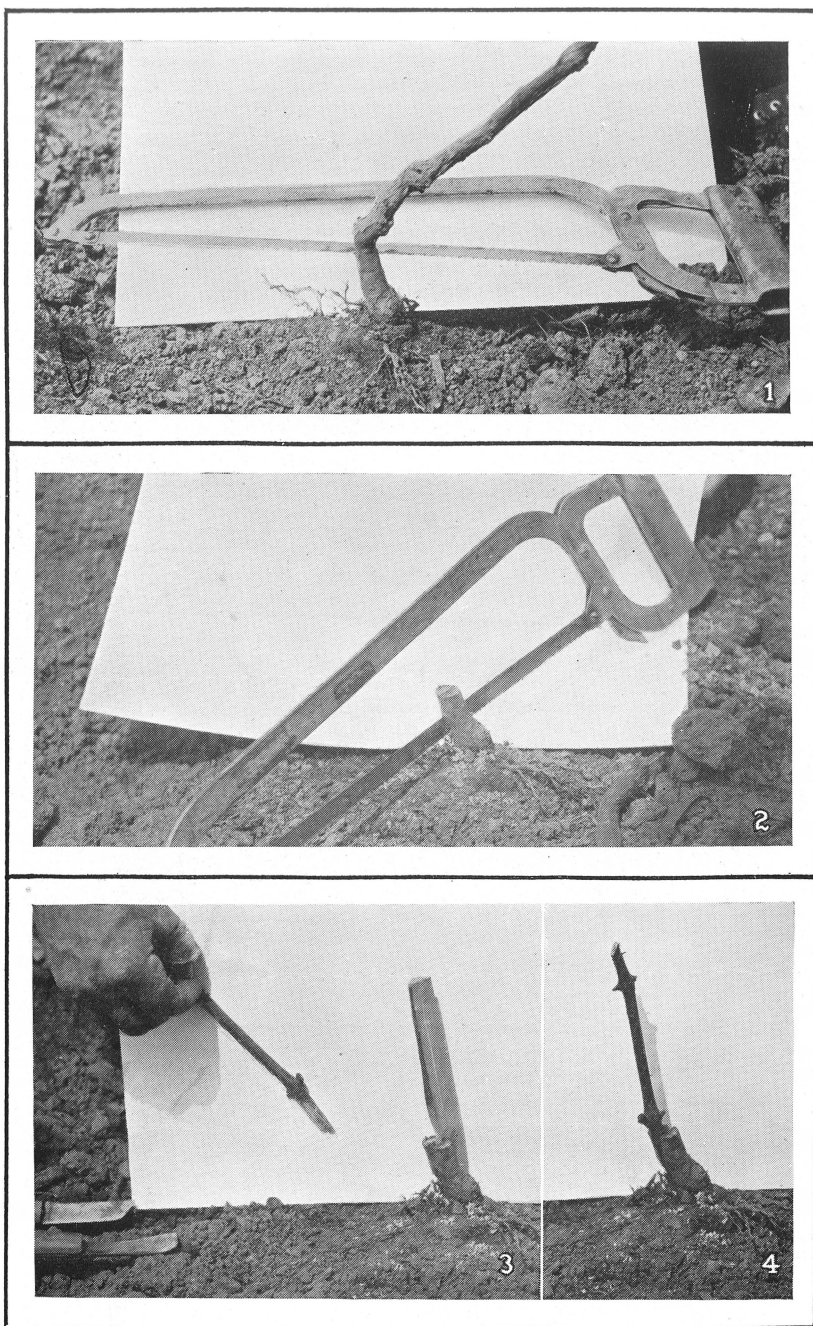


PLATE II.—GRAFTING A SEVEN-YEAR-OLD VINE IN PLACE.

1, Cutting off at ground level; 2, sawing the cleft; 3, wedging open cleft for receiving cion; 4, graft completed ready for mounding.

The first is the question of phylloxera-resistant roots. It may be possible to grow Viniferas in many parts of the State upon their own roots without serious damage from the root-louse but the danger of injury is sufficiently great to make it desirable to use resistant roots and with a wise selection of roots there is usually a marked increase in the vigor and yield of the plant. The wild Riparia grape, *Vitis riparia*, sometimes called *Vitis vulpina*, makes a desirable stock in this State. Several selected strains are used, the one called Riparia Gloire being one of the commonest. *Vitis rupestris* is used to a considerable extent in Europe and California and a number of hybrids between these two species have been found of value. A dozen other stocks are used but with our present lack of knowledge it would seem desirable to use those in which the Riparia blood predominates as this species is well adapted to the State, growing wild in most of our woods. The other species commonly growing wild in the east, *Vitis labrusca*, has not proved as valuable for this work; yet many of the good vines in the Station test are grafted on seedlings which are nearly pure Labrusca.

The cions can be whip-grafted either upon cuttings of the desired stock or upon rooted vines of the stock. The work is done in the winter and the grafts are placed under the proper conditions to form a callus before being planted in the spring. These are the common methods of propagation in the nursery but they are somewhat difficult for the amateur as it is an art to secure well callused grafts. The commonest method is to tie the grafted cuttings or roots into bundles and bury them outdoors with the graft uppermost in sand in a protected location, preferably with a southern exposure. Until about a month before time for growth to start, they are kept covered with several inches of sand and frequently the sand is covered with straw. As the weather warms up the depth of the cover is decreased. On cold nights the straw should be put back or a canvas thrown over the sand. During the last four weeks the temperature at the graft should be about 75° F.

A method which is being tried at Geneva and which offers some promise of success is to plant in the nursery row one-year vines of the desired resistant stock as soon as the ground can be worked in the spring. Just before they are ready to start into growth they are cut off at the ground level and whip- or cleft-grafted with a two-eye cion and dirt mounded up to the top of the cion.

For those who can secure desirable cions and who wish to start growing these grapes in a small way, probably the best method is that used at the Station with the cions received in 1911. Vines already in the vineyard but preferably not over six or eight years old are sawed off at the ground just before growth starts. With a thin bladed saw a cleft is cut down thru the center of the stock for about 2 inches. If the grain of the wood is straight this cleft can be split with a chisel. Cions are then cut with two buds and a wedge starting at the lower bud. The cleft in the stock is opened and the cion inserted so that the cambium tissues of the stock and cion — the layer of growth cells between the bark and wood — are in contact. If the stock is large it is best to use two cions, one on each side of the cleft. No wax is used and it is usually not necessary to tie the graft except on young vines. Dry dirt is then mounded to the top of the cion. The purpose of this is to keep the graft uniformly moist and at a more even temperature. Two or three times during the summer the mound should be removed in order to cut off any sprouts which start from the stock or any roots coming from the cion. While this is not a certain method, with proper care there will be but few failures.

A method which a Pennsylvania grower of *Vinifera*s has found very satisfactory is to root the *Vinifera* cuttings and grow them one year on their own roots; then the vine which is to be used as a stock is planted in the vineyard and the rooted cutting planted beside it so that the shoots from the two may be brought in contact with each other. In June when the plants are in full growth, two vigorous shoots (one from each vine) are brought together and a cut two or three inches long made in each parallel to the length of the cane removing from one-third to one-half of the thickness of the shoot. These flat surfaces exposed by the cuts are then brought into contact with the cambium tissues touching and are tied in place. The tops are checked somewhat by breaking off some of the growth. The following spring the *Vinifera* roots are cut off below the graft and the top of the stock above the graft is removed.

Planting.— Few *Vinifera*s need be given the space that our native sorts require because of their difference in vigor and in habit of growth. Just what distance will be best under eastern conditions is still a matter of conjecture but probably six-foot rows and the plants the same distance in the row will be satisfactory.

It is not wise to plant grafted vines with the graft much below the surface of the ground as the cion is then liable to throw out roots to such an extent that it becomes practically a vine on its own roots. The plants should be examined occasionally to remove any cion roots that may start.

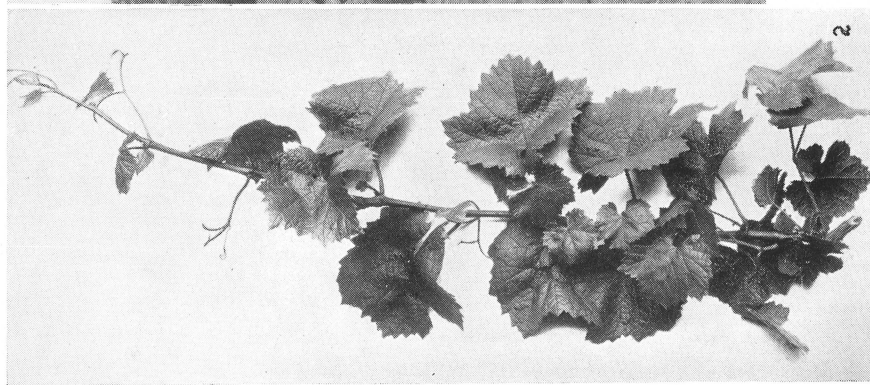
It is necessary to give the vines some support. In the west this is usually supplied by driving a stake at each vine but in the east, at least for the amateur, support can probably best be given by the regular trellis of two wires, the lower wire being about 28 or 30 inches from the ground and the upper wire 54 to 58 inches.

Pruning.— Because of the necessity of bending the trunk to the ground for winter protection, provision should be made for replacing the trunk as soon as it becomes too stiff. This can be done by leaving a replacing spur at the base of the trunk. If two-eye cions are used when the plants are grafted and both buds grow, the shoot from the upper can be used to form the main trunk while that from the lower bud will supply the replacing spur. Each year all but one of the canes coming from this spur are removed and the remaining one cut back to one or two buds until the main trunk begins to be too stiff to bend down readily, then one cane from the spur is left for a new trunk and another cane is pruned for a new renewal spur.

The main trunk is carried up only to the lower wire of the trellis. At the winter pruning, two one-year canes are selected to be tied along this wire, one on each side, and two renewal spurs are left as close to the top of the main trunk as possible. A year later canes which will grow from these renewal spurs are selected for tying up and new renewal spurs left. For the best production different varieties require different lengths of fruit canes — the one-year canes tied along the wire — but the work at Geneva has not progressed far enough so that any recommendations can be made for particular kinds. The grower will have to watch his vines and prune weak ones heavily and too vigorous ones more lightly. Under normal conditions from four to eight buds are left on each cane, depending upon the vigor of the vine. Some of the older seedlings which were used for stocks in 1911 were so large that two cions were used and in many of such cases where the roots seemed to have sufficient vigor to support the larger top two trunks were formed, one from each graft. By spreading these into a V and making the inner arms shorter, very satisfactory results were secured.

The type of growth of the *Vinifera* is somewhat different from that of our native kinds. The young shoots which spring from the one-year canes, instead of trailing to the ground or running out along the trellis wires, grow erect. Advantage is taken of this in the pruning system adopted at the Station. The canes and renewal spurs as described above are tied along the lower wire, then the young shoots which come from these grow upward to the second wire. When they are four to six inches above this they are pinched off just above the wire and any which have not already fastened themselves are tied to prevent the wind breaking them off. At the same time if any of the axial buds on the shoots — buds which form at the base of a leaf petiole and which usually remain dormant until the following year but which sometimes start into growth on the young shoots — have begun to form secondary shoots, they are rubbed off, beginning with the node next above the upper cluster and going down to the old cane. This gives the clusters more room and better light. Soon after the first heading-back, the upper buds of the young shoot start lateral growth. These secondary branches usually grow upright and when they are several inches high they are topped off with a sickle. This heading-back results in stockier and more mature canes for the following year and if properly done adds to the fruitfulness of the vine and matures the fruit better.

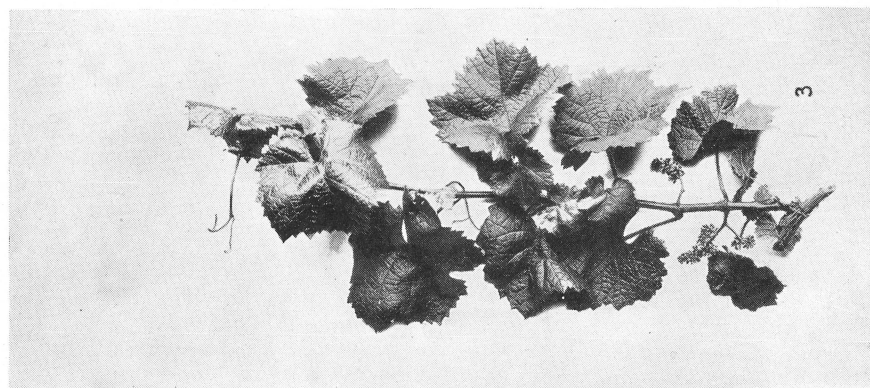
Winter protection.— A well matured *Vinifera* is seldom killed outright by the winter even if given no protection but the effect of the first winter is usually to decrease the plant's vitality to such an extent that it is unable to reach proper maturity the next season and so is usually killed the second winter. Wrapping the trunks and canes with straw is not satisfactory and is more expensive than the method used at Geneva. As soon as there is danger of the ground freezing, the vines are pruned, cut from the wire and bent to the ground. Some care has to be exercised in this that the trunk is not broken. While one man holds the vine down two others throw on dirt from each side till it is covered to a depth of five or six inches. During the winter this dirt will settle down considerably and sometimes part of the trunk will be uncovered but no injury has been noted in such cases. This work can be done so rapidly that it adds but a few cents to the cost of growing the vines.



Shoot ready for pruning and disbudding.



Vine ready for summer pruning.



Shoot pruned and disbudded.



PLATE IV.—1, INFLUENCE OF SUMMER PRUNING ON TWO-TRUNK VINE OF CHASSELAS BESSON (LEAVES PARTLY LOST FROM FROST); 2, RENEWAL OF TRUNK OF CALMETTE VINE.

THE VALUE OF VINIFERAS FOR NEW YORK.

The Vinifera grape should make a most welcome addition to the home-gardens in New York. The rich, clear flavor, the high quality and the size and fine appearance of many of the kinds of this species adapt them splendidly to the home-plantations where quality should be the chief consideration. For the amateur, the lover of good fruit, these can be recommended unhesitatingly. On the other hand, it would not be wise to attempt growing them on a large scale commercially until we have had more experience with them and wider knowledge of the requirements of this species, though the commercial grower who is supplying a high-class local market where good quality counts could well afford to begin testing some of the best varieties to find which are suited to his conditions and to the demands of his market.

The value of the wine varieties in the State is problematic. It will take several years to test out these varieties to find which are best adapted to the conditions in the wine region of the State and, after the proper kinds are found, it will be several years longer before sufficient vines could be brought into bearing to have any effect upon the wine industry. It is a question whether the demand for such grapes would be great enough to justify the expenditure of the time and money necessary to develop them. There are, however, some very good wine sorts which, at the same time, make desirable table grapes and it would be well worth while to begin to test the best of these in the Keuka region.

For nearly a hundred years breeders of grapes have been blending this foreign species with our native kinds and, as a result, of all the grapes which we mark as high in quality, practically every one has some Vinifera blood in it. Altho this hybridization has been going on for nearly a century the work has been desultory and not much more than a dozen European varieties have been used as parents and these chiefly the late-season, greenhouse sorts. There is no other field of fruit-breeding which offers greater promise than the continuation of this work and it is no idle speculation to say that viticulture in New York will be greatly enriched by the Vinifera hybrids which will be introduced in the next fifty years. This Station is already growing several hundred such hybrids.

VARIETIES TESTED AT GENEVA.

Most Vinifera varieties have originated in central and southern Europe or in southern California, regions having a much longer season and a higher summer temperature than at Geneva. Because of this, many kinds tested here will not ripen even in our longest seasons. Others which do well under favorable conditions fail in short, cold seasons. Of the ninety varieties grown here, probably less than ten can be depended on to mature their fruit year after year; but in the grape regions where conditions are more favorable this number can be increased materially, as Geneva is not in a grape region and the climate and soil are so unfavorable for this fruit that only in the best seasons does Catawba reach full maturity.

For two thousand years and more the chief purpose for which the Vinifera grape has been grown was the making of wine and a very large proportion of the varieties now under cultivation have been selected for this use; some of these wine grapes, however, make satisfactory table sorts. The table Viniferas which are shipped into the State in any considerable amount can be counted on the fingers of one hand and unfortunately all of these are probably too late to be of value for cultivation in this State. These facts increase the difficulty of selecting those sorts which will probably prove satisfactory for New York.

In discussing the varieties it has seemed advisable to separate them into four classes: (1) Desirable varieties for the grape regions of the State for (a) table and (b) wine; (2) sorts worthy of testing in more favorable parts of the state for (a) table and (b) wine; (3) kinds still on probation; and (4) varieties of little or no value in the State. The descriptions given below are of necessity brief but whenever possible sufficient characters are described to aid materially in identifying the variety. Vinifera nomenclature is in almost hopeless confusion but when identification was possible the names and descriptions have been compared with one of the latest European authorities.*

* Ampelographie. P. Viala et V. Vermorel. Tomes 1-7. Paris:1910.

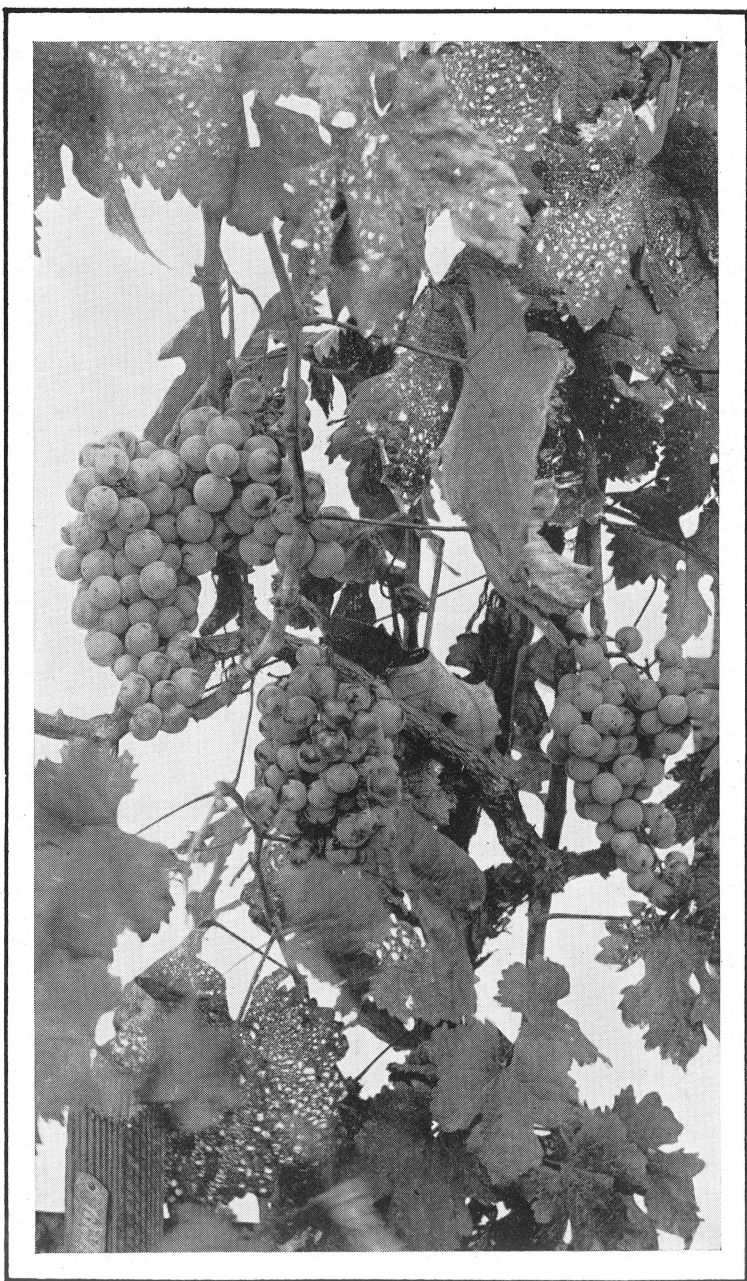


PLATE V.—GOLDEN CHASSELAS.



DESIRABLE VARIETIES FOR THE GRAPE REGIONS OF THE STATE.

A. FOR TABLE USE.

Bakator.—This is a Hungarian wine grape but its good quality and early season make it a desirable table grape.

Vine medium in vigor, productive to medium; young leaves tinged red at edges, upper surface glossy; mature leaves large, roundish, upper surface dull, lower surface downy; lobes five, terminal lobe acuminate; basal sinus deep, medium to narrow, closed to overlapping; lower lateral sinus deep, variable in width; upper lateral sinus deep, usually narrow; margins dentate, teeth shallow to medium deep. Flowers appear late; stamens reflexed. Fruit ripens at Geneva the first or second week in October and keeps well in storage; clusters above medium in size, medium in length, broad, frequently double-shouldered, tapering, medium to loose; berries medium to small, slightly oval, light red becoming dark when fully ripe, with thick bloom; skin thin, medium to tender, adherent to the pulp; flesh greenish, juicy, tender, slightly melting, vinous, sweet; quality very good.

The Chasselas Group.—Because of their ancient origin, their earliness, productivity and good quality for the table, this group is the most widely disseminated of all grapes. From this group come three of the promising grapes at Geneva.

Golden Chasselas.—This is the Chasselas Doré of France, the original type of the group. Its age and wide dissemination are shown by the great number of synonyms under which it is known, the one most commonly used in this country in addition to the two given above is Chasselas de Fontainebleau. Among all the cultivated vines none is more widely grown yet it is but a mediocre wine grape and not of the highest quality for the table. Earliness and ability to adapt itself to widely differing environments are its chief recommendations.

Vine medium in vigor, very productive; buds open in mid-season; young leaves tinged with red on both upper and lower surfaces, thinly pubescent to glabrous; mature leaves medium to above in size, slightly cordate, upper surface glabrous, lower surface slightly pubescent along the veins; lobes five in number, terminal lobe acuminate; basal sinus broad and rather deep; lower lateral sinus variable, usually broad and sometimes deep; upper lateral sinus medium to broad and frequently deep; teeth large, obtuse to rounded. Flowers appear late; stamens upright. Fruit ripens early and keeps well in storage; clusters medium to large, medium long, broad to medium, tapering, sometimes with a single shoulder, compactness medium; berries medium to above, slightly oval, pale green to clear yellow, with thin bloom; skin thin, medium tough, adherent, slightly astringent; flesh greenish, translucent, firm to medium, juicy, tender, sweet; quality good to very good.

Chasselas Rose.—This is another grape whose greatest defect is its lack of high quality; in addition it is not as productive as Golden Chasselas. Nevertheless, it is better eating than most.

of our native grapes and ripens so early for a *Vinifera* that it is quite desirable. There is some doubt that the variety received under this name is the same as the French Chasselas Violet. The Station also received vines under the name Chasselas Rose Royal. If there is any difference between these two it is that the latter is possibly of slightly better quality.

Vine of medium vigor, productive; opening leaves tinged with red on both surfaces, upper surface glabrous, lower surface glabrous to thinly pubescent. Flowers appear late; stamens upright; mature leaves medium to small, roundish; upper surface medium green, somewhat dull, smooth; lower surface glabrous; lobes three; basal sinus medium in depth and of variable width; lateral sinus medium to deep, narrow; teeth shallow, medium to wide, dentate. Fruit ripens the second week in October and is a medium to good keeper though it loses flavor in storage; clusters above and below medium, long, tapering to cylindrical, medium to compact; berries medium in size, roundish-oval, light red changed to violet-red by the bloom; skin thin, astringent, juicy, tender, sweet, mild; quality medium to good.

Chasselas Besson.—Two vines under this name were sent to the Station in 1902. Because they were not given winter protection for several years, the growth was slow and one eventually died. The other is now vigorous and fruiting well. We have been unable to find anything of the history and distribution of this grape except that it is being grown in test vineyards in California by the United States Department of Agriculture.

Fruit usually ripens the first week in October and keeps very well in storage. Clusters large, compact, tapering. Berries about medium in size, nearly round, green to clear yellow-green; skin medium thick, rather tough, somewhat astringent; flesh translucent, juicy, meaty, sweet, vinous; quality very good.

Fehér Szagos.—This is one of the many European sorts whose identity was lost when it was introduced to California and the present name given it. As it grows at Geneva it is rather unattractive because of its dull color and irregular clusters. It has also been somewhat irregular in its bearing. In spite of these disadvantages it is a promising grape as a substitute for Malaga.

Vines vigorous, somewhat uncertain bearers; opening leaves pubescent, red along the edges and a tinge of red on the upper surface. Flowers have upright stamens. Fruit usually ripens the first week in October and does not keep well in storage; clusters large to medium, broad, loose, frequently irregular because of poor setting of fruit; berries large, oval to elliptical, rather dull green, with thin bloom; skin thick, tender, neutral; flesh greenish, translucent, juicy, meaty, tender, sweet; quality of the best; seeds separating easily from the pulp.

Kuristi Mici.—Viala and Vermorel state that there is a Greek grape called Kuristi, but give no description. It is growing in some of the test vineyards of California but apparently is not

widely disseminated. Though it has not ripened every year at Geneva it is probably earlier than Catawba.

Fruit ripens the middle of October and keeps well in storage; clusters medium to large, broadly tapering, shouldered, medium loose; berries below to above medium in size, long-oval, green, becoming pale yellow when fully ripe; skin tender, not astringent; flesh juicy, tender, medium meaty, vinous, medium sweet to mildly sprightly; quality good.

Lignan Blanc.— This is a grape whose history probably runs back into the Fourteenth Century and which is cultivated in most of the grape regions of Europe. Of its long list of synonyms, two others are used to some extent in California, Luglienga and Joannenc. No other grape in the Station vineyard, including the native sorts, ripens as early as Lignan Blanc and, though the quality is not of the best, it is far superior to the first native grapes to ripen and promises to be a valuable addition to our list of home grapes. Unfortunately, the birds like it so well that unprotected clusters seldom reach maturity.

Altho the following description does not follow very closely that given by the French authorities, Viala and Vermorel, it seems certain that the vines in the Station vineyards are of this variety.

Vine vigorous, medium productive; buds open early; opening leaves light green, glossy, tinged with red along the edges, thinly pubescent. Flowers appear early for a *Vinifera*, stamens upright. Leaves medium in size, roundish, somewhat dull green, slightly rugose; lower surface glabrous; blade thick; lobes usually five tho sometimes three; petiolar sinus medium in depth, wide; lower lateral sinus medium in depth, narrow; upper lateral sinus shallow, narrow; margin dentate, teeth long, narrow. Fruit ripens the first of September and is a good keeper; clusters above medium in size, tapering, medium compact; berries medium to large, oval, yellowish-green, with thin bloom; skin thin, tender, neutral; flesh greenish-white, firm, juicy, meaty, sweet; quality good.

Muscat Hamburg.— Altho this variety is well known throughout central Europe, it attains its greatest popularity in England and America where it is the favorite grape for growing under glass. Those who have had an opportunity to taste this rich, musky grape cease to wonder that so many of our present high quality grapes are those with *Vinifera* blood in their ancestry and our grape-lovers will rejoice in an opportunity to add Muscat Hamburg to their vineyards. Altho it has not reached full maturity every year at Geneva, it seems certain that it will ripen wherever Catawba can be grown. Vines sent to this Station under the names Muscat Albardiens and Moscatello Fino proved to be identical with Muscat Hamburg.

Vines vigorous, productive; buds open late; opening leaves slightly tinged red above and along the edges, pubescent. Flowers appear in mid-season for *Viniferas*, stamens upright. Foliage large, cordate, five-lobed, terminal lobe acute; basal sinus medium in depth and breadth; lower lateral sinus shallow, narrow; upper lateral sinus deep, narrow, sometimes overlapping; margins sharply dentate, teeth deep. Fruit usually ripe before the middle of October, a medium to good keeper; clusters large, broad, tapering, shouldered, compact to somewhat loose; berries above medium to large, oval, very dark purplish-red, bloom abundant; skin thick, adheres strongly to the pulp, slightly astringent; flesh pale green, translucent, juicy, meaty, tender, sweet, musky; quality very good to best.

Early Black Muscat—Muscat Noir Precoce.—Vines under this name were received from California but the variety is probably an old European one whose identity has been lost as one of the latest French ampelographies makes no mention of such a name. The fruit is very similar to Muscat Hamburg but the two varieties are probably distinct. The berries of Early Black Muscat are slightly larger, more inclined to roundness, and usually darker in color. The season is nearly the same.

Muscat Saint Laurent.—Two white Muscats are growing on the Station grounds. One is widely known in Europe as Muscat Blanc. This is so late that it is of but doubtful value in New York; the other is Muscat Saint Laurent, not so widely known as the former but much earlier and of better quality for a table grape.

Vines medium to below in vigor, medium to productive; opening leaves tinged with red, pubescent to nearly glabrous; mature leaves medium in size, cordate; upper surface somewhat dull dark green, smooth; lower surface glabrous; nodes five, terminal node acuminate; petiolar sinus deep, narrow, overlapping; lateral sinuses varying from deep to shallow; margins crenate, with medium to deep crenations. Fruit ripens the first or second week in October; clusters small, medium to short, tapering to cylindrical, compact; berries small, oval, yellow to green, translucent; skin thick, tough, slightly astringent; flesh yellowish-white, medium in firmness, juicy, tender, sweet, musky; quality very good.

Gray Pinot—Pinot Gris.—The variety known in California as Rüländer is the Pinot Gris of France. The grayish color of this grape makes it look unripe and unattractive and so will always make this sort undesirable for market, but its earliness, good quality and rich, sweet flavor make it a favorite home grape.

Vine of medium vigor, productive to very productive; opening leaves pubescent, dull, lightly tinged with red along the edges. Flowers appear early for a *Vinifera*, stamens upright. Mature leaves medium in size, roundish, thick, upper surface slightly rugose, lower surface glabrous; lobes variable, usually five; petiolar sinus medium in depth, variable in width; lateral sinuses varying from moderately deep and wide to nearly lacking; margins coarsely to deeply dentate. Fruit ripens the first week in October and is an average keeper; clusters small, short, cylindrical, compact; berries medium to small, dull dark greenish-red, giving an unattractive, gray appearance; bloom thin; skin tender, slightly tough; flesh juicy, tender, vinous, sweet, rich; quality very good.

Rosaki.— This is a table and raisin grape of southeastern Europe and Asia Minor. According to some of the California nursery companies it is grown in that state under the name Dattier de Beyrouth, altho it would seem from some French descriptions that there is a separate, very late variety of the latter name. This grape is similar to Malaga and there is a possibility that, in some of the warmer parts of the State, it may be grown commercially as a substitute for the latter.

Vines vigorous, usually very productive; mature leaves large, roundish, rugose, usually five-lobed; terminal lobe acuminate; petiolar sinus moderately deep to deep, medium broad; lower lateral sinus shallow, broad, occasionally lacking; upper lateral sinus shallow to medium, broad; margins broadly and bluntly dentate. Fruit ripens the third week in October, keeping qualities excellent; clusters large, loose, tapering, shouldered; berries large to very large, oval to long-oval, pale yellow-green; flesh translucent, tender, meaty, vinous, sprightly; quality good to very good.

B. FOR WINE.

Most of the table grapes described above are used to a greater or less extent for wine making, tho none of them are of primary importance to the vintner. Unfortunately few of the chief wine sorts will mature at Geneva. Of those mentioned below several offer promise of value for blending with grapes of poorer quality such as Concord to make a superior unfermented juice.

Blue Portuguese.—This is the earliest blue *Vinifera* on the Station grounds. Altho primarily a wine grape it is pleasant eating but does not keep well when picked and is too well liked by the birds to leave on the vines without protection.

Fruit ripens the latter part of September; clusters medium to small, short, single-shouldered, compact; berries medium to small, roundish-oval, black, with thin bloom; skin tender, thin, slightly astringent; flesh soft, juicy, tender, sweet, vinous; quality good.

Beclan.— This sort has no value as a table grape but would probably make a desirable juice when blended in small amounts with Concord.

Vines very productive; fruit ripens about the middle of October, keeping qualities fair; clusters medium to above, tapering, sometimes shouldered, compact; berries small, roundish to slightly oval, black when fully ripe; bloom medium; skin thick; flesh juicy, melting to slightly firm, sprightly, vinous; quality good to very good.

Kadarka.— This Hungarian grape is rather similar to the black Pinots discussed below but seems to be a better grape for this region. It has no value for the table.

Fruit ripens the third week in October; clusters above medium in size, long, cylindrical to tapering, loose; berries below medium in size, roundish-oval, black, thick bloom; flesh greenish, firm, juicy, tender, slightly stringy, vinous, sprightly; quality good.

Meunier.—This is an old sort, widely grown in Europe even to the northern limit of vine culture. Altho a wine grape it is not to be passed over lightly as a table grape and should be excellent for unfermented juice either alone or in blends.

Fruit ripens the second week in October; does not keep well in storage; clusters medium to small, tapering, medium to compact; berries medium to small, oval, black, appearing blue through the bloom; flesh soft, melting and almost watery except around seeds, vinous, sweet to sprightly; quality good to very good for wine or juice and medium for table.

The Pinots.—This group of grapes is one of the oldest, most important and most widely distributed groups of wine grapes yet some of them are a pleasant addition to the table—one of these we have already described. In addition to the Gray Pinot, three others are growing in the Station vineyards, one white and two black. They are too small and of too light yield to be of much value except where high quality wine grapes are needed.

Black Pinot — Pinot Noir.—This is the type variety of the group and probably the ancestor of most of the other forms. On the Station grounds it is the earliest of the Pinots.

Vines of medium vigor, medium to unproductive; leaves medium to small, roundish, usually three-lobed or, if five-lobed, with shallow, broad, lateral sinuses. Fruit ripens the first or second week in October; clusters small, tapering, compact; brush purple at center; berries medium to small, oval, black; skin medium to thick, tough; flesh juicy, tender, sweet, vinous; quality very good. Seeds large in proportion to the berry.

Pinot de Pernand.—A variety very similar to the Black Pinot, differing only in being more productive, having larger clusters, not as high in quality and considerably later.

White Pinot — Pinot Blanc.—This is believed to be a sport of the Gray Pinot but the fruit at Geneva resembles the Black Pinot more than the gray variety except in color.

Fruit ripens shortly after Black Pinot; clusters medium in size, tapering, compact; berries medium to small, light yellow-green, thin bloom; skin medium to thick, medium to tough; flesh medium in firmness, juicy, vinous, sprightly; quality good.

Teinturier.—If the sale of unfermented juice is extended there will be an increased demand for better quality and finer appearance. All who have sampled such blends agree that the addition of a small amount of juice of certain of our high quality grapes to Concord

results in a greatly improved product. Because of its intense, wine-colored juice and good quality, no other *Vinifera* offers such promise for this purpose as does *Teinturier*.

Fruit ripens the first week in October, keeping qualities medium; clusters medium to small, rather short and broad, loose; berries small, roundish-oval, black, with thin bloom; skin tough, does not separate easily from the pulp; flesh red, soft, juicy, with wine-colored juice, tender, vinous, sprightly; quality good.

SORTS WORTHY OF TESTING IN THE MORE FAVORABLE PARTS OF THE STATE.

A. FOR TABLE.

There are several of our standard varieties of fruit which are well adapted to the southern Hudson Valley or Long Island which find the season at Geneva entirely too short for them to reach proper maturity. For this reason many of the *Vinifera* grapes which mature on the Station grounds only in the most favorable seasons would be well worth testing in the warmer parts of the State and would probably be found very desirable there.

Actoni.—The variety grown in California under this name may be the Greek table grape *Aetonychi Blanc*. It is a very meaty grape of the *Malaga* type ripening at the end of October.

Clusters large, shouldered, tapering, loose; berries medium to very large, long-oval to oval, clear yellow-green, crisp, meaty, sweet; quality good.

Cinsaut.—This is widely known in France as a wine and table grape and has also been grown to some extent in California for wine. At Geneva it ripens the latter part of October.

Clusters large to medium, broadly tapering, loose; berries large to medium, oval, black when fully ripe; skin tender, thin, not astringent; flesh meaty, tender, sweet, vinous; quality very good.

Early Frankenthal — Frankenthal Precoce.—Altho this variety has not proved very productive in the Station vineyards, it is promising because of its attractive appearance and because it is usually ripe by the middle of October.

Clusters above medium to very large, broadly tapering to blunt, medium compact; berries large, oval, black, medium bloom; skin thin, tender, astringent; flesh tender, medium meaty, juicy, vinous, sweet to sprightly; quality good.

Gradiska.—A number of the California nursery companies are selling this grape for a home table grape and wherever the season

is two weeks longer than at Geneva this should be very desirable because of its size, attractiveness, and good quality.

Clusters medium to above in size, variable in shape, loose; berries large to very large, roundish-oval, pale yellowish-green, translucent; flesh tender, meaty, sweet to agreeably sprightly, vinous; quality very good.

Listan.—The variety in the Station vineyard is known in California both as Listan and Palomino yet under these names Viala and Vermorel describe a bluish-black grape while this kind is greenish-yellow. The California Experiment Station in an early viticultural report* described this as an important Spanish white wine and table grape.

Fruit ripens about the 20th of October, keeping qualities good; clusters medium to large, long, single-shouldered, tapering, loose; berries medium to small, roundish, pale greenish-yellow, thin bloom; skin and the adhering flesh medium tender and crisp, flesh surrounding seeds melting; flavor sweet, vinous; quality good.

Mamelon.—Little seems to be known of this variety either in Europe or California, yet it appears to be a productive grape of agreeable flavor which will keep long in storage.

Fruit ripens the latter part of October; clusters large to very large, broad, tapering, compact; berries below medium in size, roundish to roundish-oval, yellowish-green, crisp, tender, sweet to slightly sprightly, vinous; quality good.

Poulsard — Ploussard.—As a wine grape Poulsard is of considerable importance in eastern France and has been grown to a limited extent in California. It makes a desirable table grape, ripening sometimes as early as the 10th of October and keeping well in storage.

Clusters below medium to large, shouldered, tapering, medium loose; berries below medium to large, oval, dark purplish-red to black where exposed to the sun, juicy, tender, melting, sweet, sprightly; quality good.

B. FOR WINE.

The chief wine-producing territory of the State is in the valleys of the western Finger Lakes, Keuka and Canandaigua. The wine grapes discussed below are worthy of testing in those parts of this region where Catawba can be matured with certainty.

Berzamino — Marzemino.—In northern Italy and southern Austria this is an important wine sort and seems to offer special

* Calif. Agri. Exp. Sta., Rpt. of the Viticultural work during the seasons 1887-93 with data regarding the Vintages of 1894-95. p. 302.

promise for this State because of the coldness of the climate in which it thrives in Europe. It is also rather desirable as a table grape.

Fruit ripens from the first to the third week in October; clusters above medium to large, shouldered, tapering, medium compact; brush slightly tinged red; berries small, round, black; flesh melting, juicy, sprightly; quality very good.

Calmette.—Very similar in its fruit characters to Teinturier, Calmette differs from the latter in being more productive, a week or more later, having soft, melting flesh and poorer quality.

Gray Chauché — Chauché Gris — Chaouch.—A casual inspection would lead one to mistake this for the Gray Pinot as clusters of the two are much the same size and shape and both have the same peculiar color which has led to their being called "gray." Gray Chauché is, however, not as good as Gray Pinot, the skin is rather tough and astringent and the flesh is not as sweet nor as high in quality.

Franken Riesling.—This is not the famous Riesling of the Rhine Valley—one of the best known grapes of Europe—but it is a widely cultivated sort of central Europe where it is commonly known as Sylvaner. At Geneva it is a heavy producer and usually ripens by the middle of October. When fully ripe it is pleasant eating. One of the vines in the Station vineyard is now 14 years old and very productive and healthy.

Clusters medium to below, slightly tapering, compact; berries medium to below, oval, yellowish-green; bloom thin; skin tender, slightly astringent; flesh medium firm, tender, melting around the seeds, vinous, sprightly; quality very good.

Large Sauvignon — Sauvignon Vert.—This variety is well liked as a wine grape especially for champagne both in France and California. When fully ripe it is pleasant eating.

Clusters below to above medium in size, tapering to cylindrical, compact; berries medium to small, oval, green to yellowish-green; flesh tender, medium melting, sweet, mild; quality good.

Slankamenka.—In Hungary this is an important white wine grape but it has little value for the table.

Fruit ripens about the 20th of October; clusters medium to large, broadly shouldered, tapering, compact to very compact; berries medium to below in size, oval, greenish-yellow; skin thick, meaty, slightly astringent; flesh juicy, soft, tender, mild, sweet; quality very good.

Syrah — Petit Syrah.—This old French grape is a popular variety in California for red wine. It has no value as a table sort.

Fruit ripens at the end of October; clusters medium to above in size, long, tapering, compact; berries below medium in size, oval, black; flesh juicy, melting, sprightly; quality good.

KINDS STILL ON PROBATION.

For one cause or another there are a number of varieties whose value is still uncertain. They show too many qualities of value to be discarded at present but their record is either too incomplete or is not sufficiently satisfactory for them to be recommended. As the test progresses some of them will, beyond doubt, prove desirable but many will be marked for discard.

Carignane.—A sprightly, bluish-black, wine grape; probably too sprightly for a table grape.

Fruit matures late; clusters below to above medium in size, compact; berries medium to above in size, meaty.

Chardonnay — Chablis.—Widely grown in northern France and southern Germany; resembles White Pinot but is two weeks later.

Clusters small, very compact; berries small, roundish oval, green, vinous, sprightly.

Lahn Traube — Van der Laan Traube.—A Holland and German grape much like Golden Chasselas but ripens two weeks later. May make a desirable table grape.

Malaga.—This is the large, oval, yellowish-green grape so commonly received in our markets from California. It is probable that it would reach a satisfactory degree of maturity in the southern Hudson Valley.

Mammolo Toscano.—It is probable that this is the Refajone Nero, a wine grape of Tuscany.

Fruit matures late; clusters large, several-shouldered, compact; berries above medium in size, purplish-black, roundish-oval, meaty, agreeably sprightly; promising as a table grape.

Mantuo de Pilas.—There is some doubt that the variety received under this name is true to name as it seems to ripen earlier than the European variety of this name is reported to mature.

As grown here the clusters are above medium in size, cylindrical, medium compact; berries medium to above in size, oval, pale green, meaty, sweet; desirable for the table but needs a long season.

Monica — Canaiolo.—Of value only for wine.

Clusters large, broadly tapering, medium compact; berries above medium in size, oval, black; skin tough; flesh melting. Ripens at the end of October.

Muscat of Alexandria.—This is extensively planted in California for a raisin grape and is usually known there as Muscat. Would probably make a desirable table grape in the southern Hudson Valley.

Black Hungarian Muscat — Muscat Noir de Hongrie.— Similar to early Black Muscat but seems to be later.

Large Early Black Muscat — Muscat Gros Noir Hatif.— Much like Muscat Hamburg but not as good in quality and is somewhat later.

Oliver de Serres.— This is a very attractive, large, firm, black grape with a sweet, vinous flavor and very good in quality. Ripens the last of October and is a good table grape.

Quagliano.— Very similar to Poulsard but not as good nor as early.

Refosco.— Of the type of Black Pinot but more productive, larger and one to two weeks later. Of value for wine only.

Savagnin Rose — Gewurztraminer — Red Traminer.— In cluster and berry this looks much like the Delaware. Flavor spicy and pleasing but the skin is too tough. Ripens the last of October.

Semillon.— A small, pale green grape of good quality, but probably too unproductive and too small to be of value.

Servan Blanc — Servant.— As a table grape this seems promising for the warmer sections of the State.

Vines productive; clusters above medium to large, shouldered, tapering, medium to compact; berries medium to large, oval, pale yellowish-green; skin tender; flesh translucent, meaty, sprightly. Considerably like Gradiska.

Steinschiller — Rother Steinschiller.— Like Savagnin Rose this variety looks like Delaware. It is pleasant eating but ripens unevenly and is rather unattractive.

Sultanina.— One of the important California grapes is the greenish-yellow, seedless raisin grape, Thompson Seedless. This is the Sultanina of Greece and the Orient. There is also a light red form called Sultanina Rosea. Both of these can probably be matured in the warmer parts of the state and will make a pleasant addition to the home vineyard because of their good quality and their lack of seeds. The berries are small but the clusters are large.

Valdepenas.— This is a wine grape which may be worth testing as a table grape in the warmer parts of the grape regions.

Clusters large to very large, shouldered, tapering, very compact; berries medium to below in size, roundish-oval, black, firm, meaty, crisp; quality good to very good.

Zinfandel.— Widely grown in California as a wine grape; of no value for the table.

Clusters too compact and the flesh too tender to handle easily. Worth testing as a wine grape because of its productivity and good quality.

VARIETIES OF LITTLE OR NO VALUE IN NEW YORK.

Because of the short growing season in New York as compared with that of most of the Vinifera regions many sorts will probably not mature even under the most favorable conditions. These are mentioned below.

Angelino.— A large, dark red grape.

Aramon.— Might possibly ripen on Long Island.

Clusters very large and compact; berries large, roundish, probably black when fully ripe.

Black Alicante — Black Saint Peter.— This is an important table grape in England and northern France. The vines at Geneva may not be true to name as here it is very late and the quality is poor.

Clusters long, tapering, medium compact; berries above medium in size, roundish, black; flesh tender, rather tart.

Black Damascus.— A large, oval, black grape with meaty, vinous, sprightly flesh. Would probably mature on Long Island.

Black Morocco — Ribier.— Clusters very large, loose; berries very large, oval, dark purplish-red.

Black Muscat — Jura Muscat.— As compared with Muscat Hamburg the clusters are more compact, the berries smaller and not as dark, the flavor is much stronger of musk, the quality is poorer and it ripens a week later.

Cornichon Violet.— A very attractive berry, very large, long, blue-black, meaty. Needs too long a season.

Elbling — Burger.— Widely grown in Germany for wine and might be of some value in the lower Hudson Valley for this use.

Clusters above medium to very large, long, compact; berries medium to above in size, roundish-oval, yellowish-green, flesh tender, stringy, sprightly.

Ferrara.— A large, purplish, table grape.

Flame Tokay.— Grown in California for shipping. A large, red grape. Would probably ripen on Long Island.

Fintendo.— Supposed to be a Spanish table grape but of no value here except for wine.

Clusters large to very large, tapering, very compact; berries medium, oval, black, tender, vinous, sweet; brush tinged red.

Green Hungarian.— Productive. Might make a good wine grape.

Clusters large, tapering, compact; berries above medium in size, round, clear green; flesh tender, mild to sprightly.

Grenache.— A late wine grape, of no value for the table.

Clusters large, shouldered, tapering, compact; berries below medium in size, oval, purplish-black; flesh melting, juicy, tart.

Malvasia.— In Europe this name is applied to a number of grapes. The variety growing at Geneva under this name is somewhat like Early Frankenthal, but is later, not as firm and more sprightly.

Malvasia Rosario.— Similar to the Malvasia discussed above but much firmer.

Millennium.— Productive and may be worth testing further.

Clusters of medium size, compact; berries medium in size, oval, yellowish-green; flesh medium tender, sweet; quality not high and skin thick and tough. Ripens the latter part of October.

Pedro Ximines — Pedro Jimenes.— Altho a wine grape this would be desirable for the table if fully ripe.

Clusters large, loose, tapering; berries large, oval, yellowish-green, medium meaty, sweet, vinous.

Schiradzouli.— A table grape with large, long, firm, purplish-red berries.

White Muscat — Muscat Blanc — Muscat Frontignan.— Similar to Muscat Saint Laurent already described, but later and with a much stronger muscat flavor and poorer quality.

